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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,341	09/24/2001	Akihiro Komatsu	Q66198	4615
7590 01/04/2005 SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC 2100 Pennsylvania Avenue, N.W. Washington, DC 20037-3202			EXAMINER GORDON, BRIAN R	
			ART UNIT 1743	PAPER NUMBER

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/960,341

Applicant(s)

KOMATSU, AKIHIRO

Examiner

Brian R. Gordon

Art Unit

1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 25, 2005 has been entered.

Response to Arguments

2. Applicant's arguments filed December 16, 2004 have been fully considered but they are not persuasive. The claim language does not preclude the device from having a constant cross-sectional area of a portion of the entire length of the chamber. The claim does not specify the cross-sectional area being constant throughout the entire length of the chamber. The claim makes reference to "the length", however the claim does not specify what applicant considers as "the length". There is a portion of the length of the chamber which the cross-sectional area is constant throughout (see figures of Jacobs).

Applicant further asserts the prior art of "Jacobs fails to teach or suggest a quantitative suction tip having a fixed volume chamber provided at a suction end of the tip." The claims do not specify the chamber is located at a suction end, but recites a lower end. The examiner asserts the chamber is located at a lower end of the device

and either end of the device may be referred to as the suction end for the device is employed for suctioning liquid.

As such the previous art rejections are hereby maintained.

Specification

3. Claim 3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 3 is directed to the process of how the device is formed. Claim 3 is not consider further limiting for the process by which a device is made does not structurally distinguish it from that of the prior art. Any device, which meets the limitation of claim 2, would also meet the limitation of claim 3.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 recites the limitation "the length" in the last two lines. There is insufficient antecedent basis for this limitation in the claim.

Length is not an inherent feature of a chamber. For example, if the chamber were spherical it would not be referred to as having length.

A more accurate description appears to be "an entire length of". On the other hand, applicant may choose to amend the claim to recite "a fixed volume chamber including a length and a predetermined volume" to establish basis.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

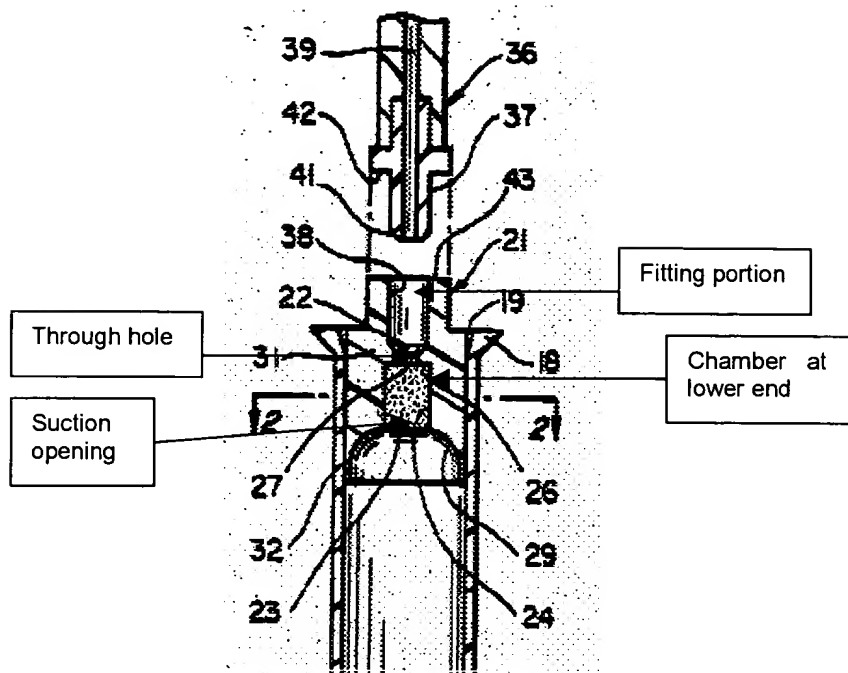
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

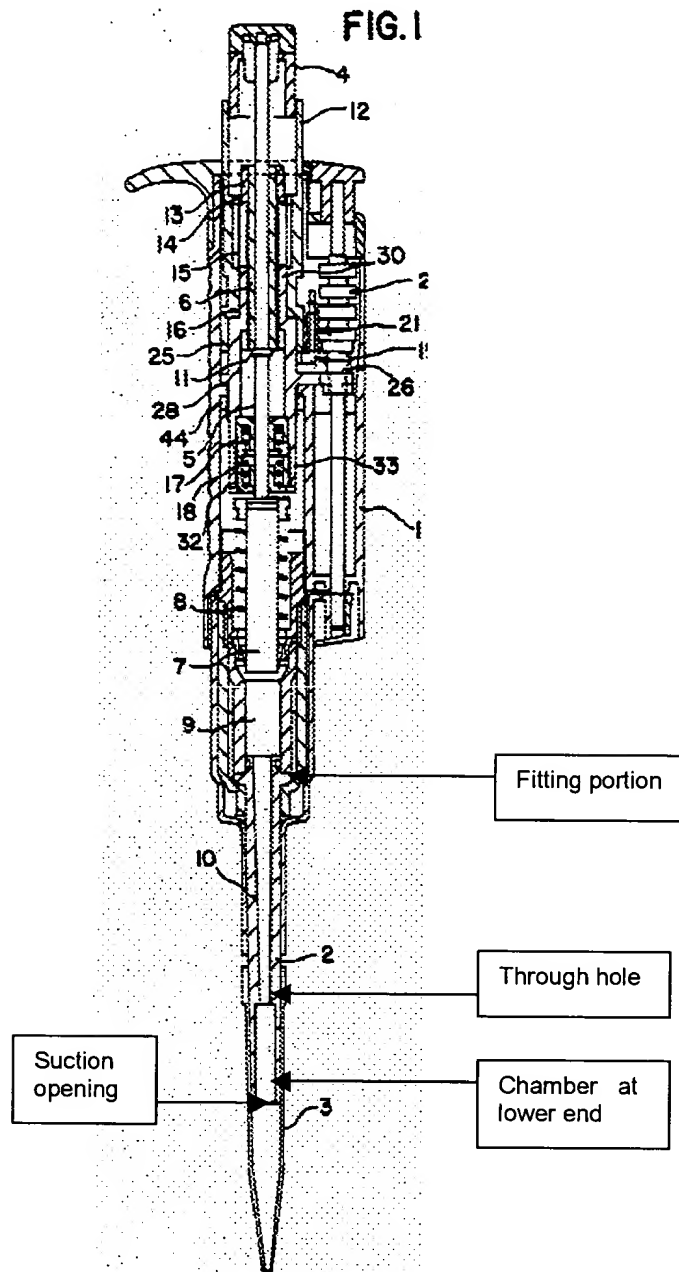
8. Claims 1-4 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Mar US 4,644,807.

Mar discloses a device that is structurally equivalent to that as claimed by applicant (see figure below).



9. Claims 1-4, 6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Sabloewski, US 5,531,131.

Sabloewski discloses a device structurally equivalent to that as claimed by applicant as indicated by the figure below.



10. Claims 1-4 and 6-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Jacobs et al. US 2002/0081747.

Jacobs et al. disclose an apparatus and a method for mixing a liquid within a disposable aspirating probe tip so that most of the liquid is forced to move past a transition zone between two different inside diameters to cause rotational mixing. The

apparatus and method can be used to provide agglutination of blood, which in turn can be used for blood typing. The probe tip can comprise a single integral piece, or two separate portions.

FIG. 3 illustrates certain preferred parameters for optimal mixing in general. Probe 112 has an aperture 134 and an exterior surface 136 adjacent to that aperture, similar to that of the prior art. However, the cross-sectional flow-through area A_2 of cavity 118 (fixed volume chamber), provided by inside diameter D_2 , is preferably no smaller than nine times that of the cross-sectional flow-through area A_1 provided by inside diameter D_1 , of cavity 114. Furthermore, the diameters D_1 and D_2 are generally constant so that their respective cavities are cylindrical. Thus, D_2 is preferably at least equal to three times D_1 .

Useful examples of D_1 and D_2 include, e.g., 0.8 mm and 3.2 mm, respectively, for use with a total height H_2 , FIG. 5, of about 3 mm.

As seen in the Figure the upper portion of the cavity tapers inward to a division wall having a through hole of diameter D_1 .

FIG. 7A, probe portion 112A (suction nozzle)" comprises a conical cavity 118" extending from an aperture 134A", to an upper portion 132A" that connects to a pump, not shown, the inside diameter of cavity 118" increasing with increasing distance from the aperture. To allow the two portions 112A" and 112B" to join together, the exterior surface 136A" adjacent to aperture 134A" is enlarged, also with a tapered shape, such as by securing a cork collar to the rest of the portion 112A". The inside diameter at aperture 134A" is relatively small, e.g., about 1 mm.

The second probe portion 112B", FIG. 7B, has an upper portion 132B" shaped to frictionally mate with surface 136A (division wall with through hole and allows for attachment to suction nozzle)", that is, with an enlarged inside diameter. Portion 112B" tapers down to a lower portion at aperture 134B (suction opening)" producing a cavity 165 (fixed volume chamber)" having an inside diameter that is greatly reduced from said enlarged inside diameter, and in fact, preferably is about the same as that of aperture 134A".

11. Claims 1, 5-6, 8 rejected under 35 U.S.C. 102(e) as being anticipated by Vann et al. US 20003/0021734.

Van et al. discloses a delivery system. The system may comprise a substantially T-shaped frame, denoted generally as 60, supports both extractors 50a, 50b. More particularly, frame 60 includes an upper, horizontal Where a tube already having a longitudinally extending bore or lumen, such as at 86a in FIG. 4(A), is used, cavity 70 can be formed by drilling a counterbore into an end of the tube, with the counterbore having a diameter greater than the inner diameter of the lumen 86a, yet smaller than the outer diameter of the tube.

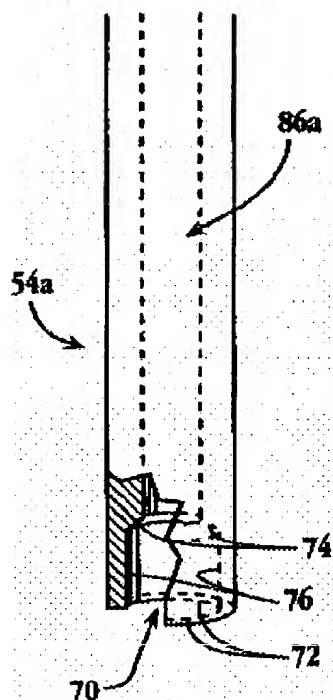


Fig. 4A

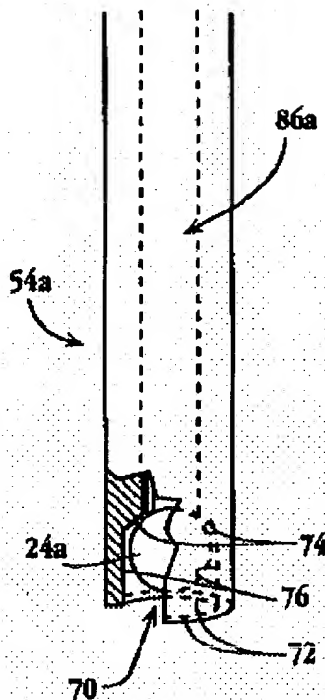


Fig. 4B

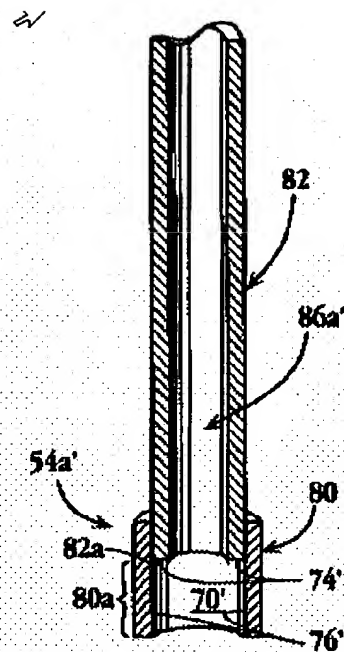


Fig. 5

As seen in the figures above the projections (tips) have a lower cavity (chamber) of constant cross-sectional area terminating at an upper end with a through hole of a smaller cross-sectional area and the lower end has a hole that is equal to the cross-sectional area of the that of the cavity (see also figure 8).

"A pressure-control source in communication with the manifold above each projection array can effect the pressure increase. As shown in FIG. 1, for example, pump 102 can communicate with manifold 88a via flow line 98a; and pump 104 can communicate with manifold 88b via flow line 98b. Upon activating one of the pumps and generating an increased pressure in a respective manifold, gas will flow downward

through the lumens of a respective projection array in a manner tending to blow any retained objects away from the projection end regions.

Detection instrumentation can be included in the system of the invention for monitoring the various operations. In one embodiment, for example, means are provided for determining whether or not a target object, such as a cover member or bead, is present at the lower end region of each projection. In an exemplary arrangement, cessation of gas flow and/or attainment of an expected (predetermined) low-pressure value in the vacuum flow lines can be used as an indicator that each projection has properly engaged and attracted a target object, such that a substantially airtight seal is formed across the lower opening of each projection." (see paragraphs 0121-0122)

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. as applied to claims 1-4 and 6-8 above, and further in view of Pelc et al. US 6,592,825.

Jacobs et al. does not disclose a control unit for detecting the suction pressure and termination of a suction operation upon detection of a change in suction pressure.

Pelc et al. disclose a microvolume liquid handling system including a microdispenser employing a piezoelectric transducer attached to a glass capillary, a positive displacement pump for priming and aspirating transfer liquid into the microdispenser, a controller for controlling the pressure of the liquid system, and means for washing the microdispenser between liquid transfers, and a pressure sensor to measure the liquid system pressure and produce a corresponding electrical signal. Dispensing of a single sub-nanoliter drop can be detected in real time. As the result of dispensing the liquid in sub-nanoliter droplets, the dispensed volume can be precisely

controlled. The dispenser automatically detects the liquid surface of the transfer liquid, automatically aspirates, analyzes desired volume of the transfer liquid, dispenses the transfer liquid without contacting the destination vessel or its contents, and automatically washes off the transfer liquid from dispensing system after each transfer. This system is capable of automatically sensing liquid surfaces, aspirating liquid to be transferred, and then dispensing small quantities of liquid with high accuracy, speed and precision.

The pressure sensor 14 senses fluctuations in pressure associated with priming the microvolume liquid handling system 10, aspirating transfer liquid 24 with pump 12, dispensing droplets 26 with microdispenser 16, and washing of microdispenser 16 using pump 12.

The device comprises a control logic 42 that instructs pump 12 to move the plunger 34 down in order to aspirate transfer liquid 24 into the microdispenser 16. The pressure signal is monitored by control logic 42 during the aspiration to ensure that the transfer liquid 24 is being successfully drawn into the microdispenser 16. If a problem is detected, such as an abnormal drop in pressure due to partial or total blockage of the microdispenser, the control logic 24 will send a stop movement command to the pump 12. The control logic 24 will then proceed with an encoded recovery algorithm. Note that transfer liquid 24 can be drawn into the microvolume liquid handling system 10 up to the pressure sensor 14 without threat of contaminating the pressure sensor 14. Additional tubing can be added to increase transfer liquid 24 capacity. Once the transfer liquid 24 has been aspirated into the microdispenser 16, the control logic 42 instructs the robotic

system 58 to reposition the microdispenser 16 above the chosen target, e.g., a microtitre plate.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Jacobs et al. to include the pressure sensor and control logic of Pelc et al. in order to aspirate liquid to be transferred and dispense small quantities of liquid with high accuracy, speed and precision.

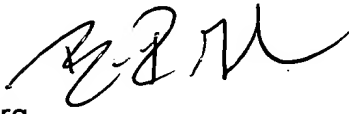
Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Karg, Jeffrey A. et al.; Higuchi, Akira; and Lugmair, Claus G. et al. disclose suction and dispensing devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is 571-272-1258. The examiner can normally be reached on M-F, with 2nd and 4th F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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